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C. E. M. Lawrence

April 1888

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THEINE  
IN THE  
TREATMENT OF NEURALGIA

BEING A  
PHYSIOLOGICAL CONTRIBUTION TO THE  
THERAPEUTICS OF PAIN.

BY  
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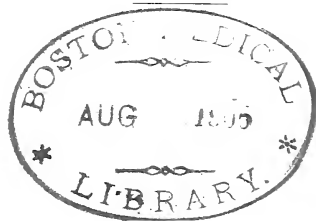
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PRESS OF WM F FELL & CO.,  
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TO  
DR. EDWARD R. MAYER,  
Of Wilkesbarre, Pennsylvania,

IN APPRECIATION OF HIS EMINENT PROFESSIONAL ABILITY,  
AND IN GRATEFUL REMEMBRANCE OF HIS MANY  
DEEDS OF PERSONAL KINDNESS TO

THE AUTHOR,

This little volume is Respectfully Dedicated.





## PREFACE.

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This essay on Theine originally appeared in the *Polyclinic*, from September, 1887, to February, 1888; and in order to give the research which has been made of this drug a more permanent place in medical literature, it was deemed proper to publish it in a separate little volume.

Herewith I desire to express my warmest thanks to those of my medical friends who have been kind enough to report to me the results which they obtained in the clinical employment of theine; for I feel that the practical value which this investigation possesses is chiefly due to this part of the contribution.

T. J. M.

1829 SPRUCE STREET, PHILA.,  
March 5th, 1888.



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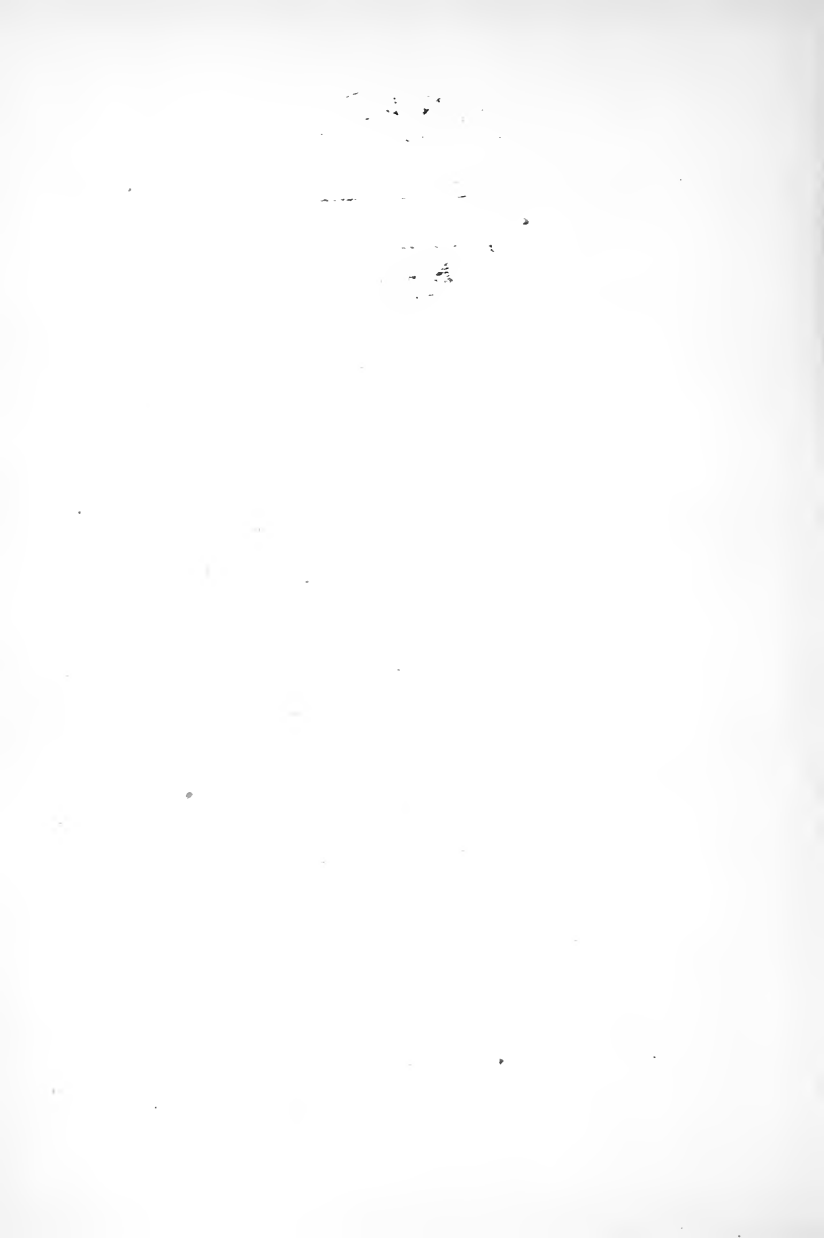
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## INTRODUCTION.

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### CHAPTER I.

#### THEINE

The tea-plant, from which *theine* is obtained, is a shrub from twenty to thirty feet high, and is indigenous to the southern part of Asia, but is extensively cultivated in China, Japan, and in South America, as well as to a small extent in the United States. Its use as a beverage dates from a very early period in Chinese history, but the Greeks and Romans were ignorant of its existence, and it was only introduced into Europe about the year 1657. The botanical origin of tea is *Thea Bohea*, *T. viridis*, *T. sinensis*, and *T. assamica*, and a few hybrids; and the many varieties of tea in the market are prepared by selecting young or old leaves, and subjecting them to various processes of treatment. Tea

was probably first used for medicinal purposes. It is a common custom of our own day to apply tea leaves for the purpose of reducing inflammation and allaying pain.

Theine, to which tea principally owes its virtues, is an alkaloid, and was first found in the leaves of Chinese tea by Oudry, in 1827. This discovery was confirmed by Mulder and Jobst, in 1838, who believed it to be identical with caffeine and guaranine. Its chemical formula is  $C_8H_{10}N_4O_2$ , and it is known as trimethylxanthine. It occurs in snow-white, needle-like crystals, is almost tasteless, but produces a slight tingling on the end of the tongue, which is immediately followed by a temporary local anæsthesia. It is soluble in fifty parts of cold, but more soluble in warm water.

## CHAPTER II.

### THE PHYSIOLOGICAL ACTION OF THEINE

My first experiments with theine were made in the spring and summer of 1885, and were published in the *Therapeutic Gazette* for September, 1885, under the title of *The Physiological and Therapeutic Action of Caffeine, Theine, and Guaranine*. At this time I was ignorant of the fact that theine, caffeine, and guaranine were manufactured indiscriminately from coffee, tea, kola nut, Paraguay tea and guarana; and that they were all sold out of the same bottle and labeled according to the demands of the trade; but I supposed that I was using theine made from tea leaves, and caffeine from coffee beans. Inquiry, however, soon undeceived me and demonstrated very positively that nearly all of that which is sold under the name of caffeine at present is not caffeine at all, but theine,

since it so happens that it is cheaper to manufacture the alkaloid out of tea leaves than from any of the other raw materials. Moreover, it was further found that very little, if any, theine or caffeine is manufactured in this country, and that these agents are principally imported from Europe.

Of course, under these circumstances, it was quite evident that the article which I used for theine must have emanated from tea, but on account of the uncertain nature of that which I used for caffeine I determined to review all my previous work on this subject. That I used two different agents was quite certain, for I could not have obtained the varying results in my experiments which I did if they had been alike in composition. Therefore Mr. William C. Harris, then with Messrs. Henry C. Blair's Sons, kindly undertook to manufacture both alkaloids for me from tea and coffee, respectively, and quite recently I also received the same alkaloids, made from the same sources, from Merck, of



Darmstadt, who, since my second series of experiments, has informed me that he will in the future manufacture these alkaloids separately—hence in ordering from him it is necessary to specify the alkaloid which is wanted. I fully reviewed my former work, and the net result confirms the conclusions drawn from the first series, and I have even found reason for believing that the difference between the action of the two alkaloids in regard to sensation is greater than my earlier experiments indicated.

The gross effects of tea and coffee on the animal economy have always been regarded as dissimilar, but their alkaloids have, until quite recently, been universally considered identical in their action. The supposed identity of action of the two latter agents can only be explained on the score that, after once having been shown that they are chemically alike, the assumption naturally followed that they must also be alike in their physiological action. This view of their supposed identity

of action has also been encouraged by Aubert, Albers, Amory, Bennett, McKendrick, Burnett and others who investigated the drugs experimentally, although Léven, as far back as 1868, showed that theine produced convulsions in frogs while caffeine did not; and that the lethal dose of theine was larger than that of caffeine. One important reason why the results of Léven differ so materially from those derived by others lies in the fact that he used the genuine alkaloids produced separately from tea and coffee, which does not appear to have been the case with the other experimenters. Moreover, in view of the fact that the effects of theine and caffeine were believed to be the same, it is very difficult to obtain evidence as to the action of either agent. Toxicologically, we know more about caffeine than we do about theine, for, since coffee is much more powerful than tea, it has occasionally been employed for criminal purposes.

A detailed account of the large number of

experiments which I made with these agents will not be given here, since they would swell this little work to undue dimensions; but their condensed results, which appear below, demonstrate that, while the actions of theine and caffeine agree in many respects, they also disagree in some important particulars. They both first affect the anterior extremities of frogs, and both diminish respiration and cause hyperæsthesia during the latter stage of the poisoning process, although the supersensitiveness is much more marked in theine than in caffeine. They differ in the following respects: Theine principally affects sensation, while caffeine does not; theine produces spontaneous spasms and convulsions, while caffeine does not until very late in the stage of poisoning; theine impairs the nasal reflex early in the poisoning process, while caffeine does not, if at all, until the very last stage; the lethal dose of theine is larger than that of caffeine.

The differences in the action of these two

agents as here indicated will, I think, be sufficient to convince even the most'skeptical that theine and caffeine can no longer be regarded as identical, so far as their physiological action on the frog is concerned. In order to show to myself, as well as to others, that there is a decided difference between the two preparations, and that I did not practice any unconscious self-deception, I frequently tested the contents of two numbered vials, one of which contained theine and the other caffeine, but which were only known to me by their numbers, and could, without difficulty, always designate the true nature of each specimen after testing its action on the frog. This is, certainly, a crucial experiment which demonstrates very clearly that the toxicological tests of experimental physiology are more accurate and delicate than those of physics and chemistry combined.

The argument which has been advanced against my deductions that the theine and caffeine employed by me were probably not

chemically pure, must, I think, fall to the ground, when it is taken into consideration that precisely identical results were obtained from two separate manufactures of both alkaloids by Merck, of Darmstadt, against neither of which the charge of impurity can be brought. In the early part of my experimental review I did use preparations of both which were not altogether free from the coloring matter of the raw material, but they gave rise to the same differences as those which were brought out subsequently by the purer specimens. However, if the objection of impurity be still urged, it devolves on those who make it to manufacture such specimens of both alkaloids which will satisfy their ideal of purity, and have them subjected to a proper test for the purpose of finding out whether they fail to give a differential physiological reaction.

The power of theine to produce such decided and complete sensory paralysis in the lower animals led me to test its physiological prop-

erties on the healthy human being, and, with this end in view, I introduced moderate, or probably small, doses of the drug hypodermically in a number of instances, and noted the results.

In the main, there was a general agreement in the symptoms which developed, and hence only one case, typical of the rest, will be given here. The drug was injected into the left forearm of an adult in good health, whose same arm, however, was fatigued by carrying a satchel to the railroad station on the previous morning.

1.40 P. M. Injected  $\frac{1}{5}$  grain of theine in left forearm, near elbow.

1.42. Fatigue in arm gone.

1.43. Diminution of sensibility in left forearm, especially around seat of injection.

1.46. Diminished sensibility extends as far as hand.

1.48. Some burning at seat of injection.

1.49. Touch impaired in tips of fingers of same hand.

- 
- 1.51. Tingling in wrist and fingers.
  - 1.52. No discernible influence on pupil.
  - 1.54. Voluntary motion of arm and hand unimpaired.
  - 1.56. Burning around seat of puncture gone.
  - 2.02. No impairment of sensation above the elbow.
  - 2.03. Slight shooting pains along the posterior part of left arm above elbow.
  - 2.06. Sensibility of finger tips impaired.
  - 2.08. Finger tips very dull.
  - 2.11. In playing the piano, can move the fingers of left hand as well as those of right.
  - 2.13. Mind perfectly clear.
  - 2.30. Sensibility absolutely gone around seat of injection.
  - 2.34. Finger and left hand feel as if "asleep."
  - 2.44. Left hand numb.
  - 2.55. No difference in temperature between two hands.
  - 3.01. Finger tips very numb.
  - 3.06. Feels somewhat sleepy.

- 5.30. Sensibility still impaired, especially in finger tips. Arm above elbow uninfluenced.
- 6.40. Sensation more normal in forearm. Finger tips still feel numb.
- 8.00. Sensation entirely restored. Some redness and tenderness around seat of puncture.

The physiological action of theine on man, as brought out in this as well as in a number of other observations under my care, may be summed up as follows: Dose from one-fifth to half a grain. Numbness of arm and hand below seat of injection—"a feeling as if the hand had been steeped in a solution of carbolic acid," as one of the subjects of experimentation expressed it. A feeling of coldness and an occasional disturbance of temperature in the member under its influence. A slight reduction in the pulse rate, and no intoxication of the brain. No impairment of motion. The anæsthesia shows itself in a very few minutes, and is much more marked in some individuals than in others. A



relief to the feeling of fatigue.\* The temperature disturbance was not regular. Out of four cases in which the temperature was taken, it showed no difference in one, and in another one the uninjected hand was slightly higher ( $0.4^{\circ}$  Fahr.) in temperature than the injected one. In two there was quite a marked fall in temperature—one  $0.8^{\circ}$  Fahr. and the other  $1.2^{\circ}$  Fahr. lower in the hand of the injected than in that of the uninjected arm. And, strange to say, the hand which showed the greatest depression in temperature experienced the least degree of anæsthesia. A certain feeling of coldness always accompanies the numbness produced by theine, yet, in my earlier observations, I repeatedly failed to detect any thermometric differences.

Dr. C. H. Castle, of Cincinnati, Ohio, was induced to test the action of theine by the appearance of my first article on this subject.\* The

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\* The Therapeutic Action of Theine; a New Analgesic. *Phila. Medical News*, December 12th, 1885.

results of his experiments, which were both of a physiological and chemical nature, were read before the Cincinnati Medical Society, and published in *The Cincinnati Lancet and Clinic* for February 6th, 1886, and since they were made with pure theine, extracted by his own chemist, and because they add some hitherto unobserved features in the action of the drug, they are extremely interesting and instructive. He made, in all, three physiological experiments on himself, of which he says:—

“ The first time I injected one-sixth of a grain into my left forearm, immediately below the flexure of the elbow joint. I will not weary you with the details of the observations as made at intervals of a few minutes. The noticeable effect was remarkably rapid. An angry blush and swelling spread from the point of injection, but what looked like a most delicately tender spot was singularly devoid of sensation. It was not, nor did it become, totally anæsthetic, but in what appeared to be

an inflamed area of sensibility was markedly dulled. Presently a numbness, such as we feel when a member is beginning to 'go to sleep,' from pressure upon its supplying nerves, stole over my wrist and hand. Little tinglings, scarcely noticeable had not one been on the watch for strange manifestations, came and went in various places. At no time was motility impaired. The temperature of the left hand, and I beg to call your attention to this point, was markedly lowered. The effects of the injection lasted about two hours.

"The second injection was made under somewhat different circumstances. I had rather severely bruised my right hand, and the pain on pressure over the metacarpal bone was quite severe. I therefore injected one-third grain of theine subcutaneously over the ulnar nerve just below the elbow.

"The same phenomena were noticed as in the first use of the alkaloid—sensibility around the injection was markedly diminished, lower

down the forearm and in the wrist and hand less markedly so ; the right hand lost as much in temperature as had the left hand previously, but I am compelled to say that I was disappointed in the analgesic effect that I had expected. The extreme sensibility was dulled, to be sure, and my hand no longer hurt when I put it into my overcoat pocket, as it had before, but any deep pressure instantly informed me that the nerves about the joint still resented the impact of a foreign body with the surface.

“The third observation was made again upon the left arm ; this time one-half of a grain was used, and though an accident, perhaps, somewhat marred the experiment, some points were brought out more prominently. The injection, made for me by a friend, was a deep one—intermuscular—and the withdrawal of the needle was followed by a slight hemorrhage, sufficient to raise a conical subcutaneous tumor of a diameter of a one-cent piece. Instantly there was a deep-seated pain, probably due, I

thought, to extravasation from the wounded vessels into the intermuscular planes. Full extension was impossible; partial extension very painful; the painful seats being deeply under the point of injection and the dorsal aspect of the metacarpo-phalangeal points.

“As in former observations, sensibility was affected almost immediately, and in three minutes the left hand was blanched and almost cold to the touch. My pulse was always full, strong, and but slightly more frequent than normal. Very soon peculiar constitutional disturbances appeared, and not entirely like those described in the standard works on *materia medica*. I was excited and talkative, and so rapidly did I talk that I would soon exhaust a subject broached by others, and endeavor to introduce some natural descendant of the idea as a topic of conversation, apparently so far ahead of its proper sequence in a well-ordered train of thought as to appear like an interruption with an irrelevant subject. Failing to

gain a hearing, as I frequently did, I would indulge in snatches of song or broken ejaculations which had a world of meaning in them then, but which, as I look back upon them now, seem utterly absurd.

“Alternating with states of great bodily activity were spells almost of a fainting character. These were seven or eight in number, and beginning soon after the injection, gradually ceased after the lapse of six or seven hours.”

This vivid description of the effects of theine, as Dr. Castle observed them on himself, is very instructive, and in some respects new. The psychic disturbance which he experienced I have never observed, although I have administered five times the quantity he employed; and the only way in which I can account for his cerebral intoxication is on the score that the deep injections which he practiced chanced to introduce the theine directly into a blood vessel, and it was at once carried to the brain and produced the hallucinations as described. This

is all the more probable because the central disturbance manifested itself directly after the injection, which, ordinarily, should not have appeared until in a later stage of the poisoning process.

From these experiments, and from those which were made on the frog, I think the following conclusions may be legitimately drawn concerning the physiological action of theine on man:—

1. It has a special affinity for the nerves of sensation.
2. It produces anæsthesia when administered subcutaneously.
3. Its anæsthetic action is confined below the seat of its injection, *i. e.*, its influence extends from the centre to the periphery, and not in the opposite direction.





### CHAPTER III.

#### THE SPECIAL THERAPEUTIC INDICATIONS FOR THE USE OF THEINE

From its physiological action it is quite obvious that in theine we possess an agent which has the power of paralyzing sensation without affecting motion, and that it does this with a great degree of certainty and without any appreciable injury to any part of the body, even when administered in large doses. It now remains for clinical medicine to demonstrate and to establish how far this analgesic property can be utilized, and with this purpose in view the greater portion of the following pages will be devoted to the task of pointing out the special pathological conditions and to that of the citation of cases in which the drug is indicated.

In order to obtain the full effect of theine, it is not necessary to inject it deeper than immediately beneath the skin. Of deep injections I

am not able to speak intelligently, since I was always satisfied with the results which are derived from superficial injections. Dr. Castle, in the article already referred to, relates his own personal experience with one deep injection, in which the drug certainly exerted a marked influence on the brain, owing, probably as has already been stated, to the fact that the whole dose found direct entrance into the circulation, and was at once carried to the great nerve centres.

Again, theine, as a rule, is surprisingly prompt in exerting its analgesic action. I have, on a large number of occasions, witnessed patients who had too much pain to move an arm, or who were too stiff to stand erect, swing their arms and straighten their bodies in less than five minutes after its introduction. It is not always so prompt, but this is probably due to the smallness of the dose. I have seen cases where no benefit had been derived from one-third of a grain, which, on the dose being

doubled, improved at once. Therefore, when a single dose fails to act favorably, it is always advisable to increase, even if this has to be done to a large extent. I have repeatedly injected as much as two and one-half grains without experiencing anything except the best results. I would not hesitate to go even beyond this limit. To one patient who was suffering from the most intense neuralgia of both lumbo-sacral and left cervico-brachial plexuses, which was accompanied by sleeplessness, spasm of the muscles of both legs and of those of the left arm, I gave two and one-half grains of theine subcutaneously in four different localities along the spine, with instantaneous relief to the pain, and the induction of sleep during the following night. This amount was injected daily for twenty-one days in succession, at the end of which time he was almost entirely free from pain, improved in appetite and in sleep, and felt better in every way. In another case of locomotor ataxia, I injected three grains

of theine in different spots along the spine every other day, chiefly for the purpose of relieving the pain and contractions in the extremities, as well as the constriction around the base of the chest. It removed all these difficulties at once, and made the patient feel more comfortable than before. Another feature which recommends theine to favor is its prolonged influence. After pain has once been relieved by it, it is very rare to find the same returning inside of ten or twelve hours, and oftener not until in twenty-four hours, and then, in all probability, not in its original intensity. I am referring now to obstinate cases of pain. Where the pain is more unstable, it is not rare to find that one or two injections relieve it permanently.

No prolonged irritation and no inflammation have ever been produced during my experience at the seat of its injection. It gives rise to some burning at first, which disappears in the course of a very few minutes, and is replaced by a

marked area of anæsthesia. Most of the burning is undoubtedly due to the comparatively large amount of water which is necessary to dissolve a drug of a solubility as low as that of theine. When it is prepared with benzoate of soda its solubility is markedly increased, and I have therefore used it for more than a year according to the following formula :—\*

R. Theine,  
Sodium benzoate,   āā       ℥j  
Sodium chloride,           gr. viij  
Distilled water,           fl ℥j.       M.  
SIG.—For hypodermatic use. Six minims equal  
one-half grain of theine.

Finally, in regard to the employment of a particular kind of theine, I would say that everything which at present falls within the commercial description of both drugs is principally made up of theine ; hence, very good clinical results are obtained from that which is found in

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\*Theine tablets for hypodermic use are now manufactured by Mr. J. A. Kyner, pharmacist of the Phila. Polyclinic. Also by Mr. William C. Harris, 23d and Spruce Sts., Philadelphia.

the market, although it is very obvious, from my experimental deductions in regard to the differential action of theine and caffeine, that the best results are obtained from the genuine article, which is now manufactured and furnished by Merck, of Darmstadt, Germany, and which I altogether employ at the present time.

In order to avoid annoyance and disappointment, it is highly important to constantly bear in mind the pathological conditions which only are amenable to the influence of theine. It must be borne in mind, first of all, that its function is solely that of pain-relieving; and while it performs this office to perfect satisfaction, it also fails to give permanent relief to obstinate and protracted pain, unless it is aided by remedies which tend to improve the nutritive state of the affected nerves, or which are capable of removing the diatheses upon which the painful affections depend. A neglect of this simple rule frequently led to failures in my earlier employment of the drug. Therefore the

burden of what follows in this essay will be devoted to a consideration of the relation between the action of theine and neuralgia, as well as that between its action and other kinds of pain which are generally associated with various constitutional conditions, like malaria, anæmia, simple chronic rheumatism, chronic gonorrhœal rheumatism, gout, etc.; and in connection with the theine treatment, the importance of appropriate auxiliary medication in each special condition will be fully discussed.

THE DIFFERENTIAL ACTION BETWEEN THEINE  
AND MORPHINE.

Morphine enjoys the distinction of being the favorite analgesic of the medical profession, and there can be no doubt that it fairly merits this position. The physiological action of morphine, however, differs widely from that of theine. It produces its analgesia by primarily affecting the cerebral centres, although the experiments of Eulenberg, Falk and others show that it causes a certain degree of local anæsthesia at

the seat of injection. But in order to manifest its characteristic action, which is central and not local, it must be carried to the cerebrum by the circulation, and make its impress there, while theine, as we have seen, has a local action, which is entirely independent of the great nerve centres. The peripheral action of theine seems to be confined altogether below the seat of its injection, although there can be no doubt of its general absorption by the blood and of its distribution throughout the whole body. The feelings of patients and of persons on whom I have made physiological experiments invariably attest the fact that the brain is exempt from any narcotic impression, and that its perceptible action is wholly confined to a point below its introduction, in which region they feel a sense of tingling and of numbness. This localized influence brings out one of the great therapeutic advantages which theine possesses over morphine and over all other agents of this class. By operating only on the peripheral portion of



the trunk of a nerve and of its ramifications, it leaves the higher nerve centres intact, and hence does not bring about the undesirable central intoxication which almost always follows a full dose of morphine.

It is very clear, then, that the spheres of action of morphine and of theine are entirely different, and that each one must be prescribed in suitable conditions, and in order to achieve this practical end the following rule may be suggested: When it is necessary to narcotize the centres of innervation in order to relieve a given pain, then morphine is indicated; but when it is not necessary to do this, then theine will accomplish the work safer, better and more promptly than morphine. On general principles it may, therefore, be stated, that morphine gives the best results in acute pain, while theine is most beneficial in chronic affections of the sensory nerves.

## CHAPTER IV.

### NEURALGIA

Neuralgia is preëminently a painful disease. It is, in most instances, a unilateral and an intermittent affection, and manifests itself in tender spots, which mark the superficial exit of the affected nerves. It is generally looked upon as a functional disease; but there can be no doubt that the condition which answers to the symptom of pain is one in which there is a morbid constitutional change of the nerve giving rise to it, although there is no evidence of any such change to our unaided senses. Furthermore, there can be no doubt that in all cases of neuralgia either the general or local condition of the sufferer at the beginning and during the attack is one of anæmia, depression and debility. The affected nerve is impaired in its nutrition, and hence its vitality sinks below that standard which constitutes *nerve* health.

The subjective expression of this exhausted state is one of pain, which Valleix defines as the cry of a hungry nerve.

Neuralgia is generally of malarial and sometimes of rheumatic origin, but is also frequently associated with certain periods and conditions of life in which the malarial and rheumatic elements may be entirely wanting. Thus, it occurs in the middle period of life, when the body is most exposed to severe and protracted labor, to child-bearing, etc., as well as during the period of bodily decay, when senile degenerations are prone to set in. Then, again, it also manifests itself in states of malnutrition, anæmia, etc. Topographically, neuralgia may be divided into several local varieties, the chief of which are the sciatic, crural, intercostal, dorsal, cervico-brachial, cervico-occipital and trigeminal—given here, probably, in the order of frequency with which they meet the eye of the practitioner. Cases of each of the above-named varieties, which were treated with theine, will

be given in their appropriate places, as well as their additional treatment.\*

#### SCIATICA.

CASE I.—Mrs. A.; aged 49 years; came under my care May 2d, 1885, when she had constant pain in right leg from hip to foot, ever since the preceding Christmas. The pain followed the course of the nerves of the leg, and, of course, was very much aggravated by walking. The leg was considerably atrophied and was weak and uncertain in its gait. Her appetite was poor and bowels irregular, and she passed whole nights without sleep, on account of pain.

\* The additional treatment, unless otherwise stated, frequently consisted in the administration of two mixtures, which I found very useful, the formulæ for which will be reproduced here; and in order to save space and repetition, they will be referred to in the following pages as the quinine and ammonia and the sodium salicylate mixtures, respectively:—

<b>R.</b> Quininæ sulph.,		<b>R.</b> Sodæ salicyl.,	
Ammoniæ mur.,	āā	Potass. acetat.,	
Tinct. ferri chlor.,	f3ss	Potass. bicarb.,	āā
Chloroformi,	gtt. x	Tinct. digitalis,	f3iij
Syr. simplici,	f3iiss	Aquæ menth. pip.,	q.s. f3iv
Aquæ menth. pip.,	q.s. f3iv.	<b>M.</b> SIG. A teaspoonful every	
<b>M</b> SIG. A teaspoonful every		4 hours.	
4 hours.			

She was anæmic, and had been treated with iron, quinine, ammonia, sodium salicylate, potassium iodide, atropine, morphine, poultices, blisters, etc., without avail, until the following 18th of July, when I injected one-fifth grain of theine into the calf of her leg. The pain ceased in less than five minutes, and never returned in its original force. In half an hour her heel and foot began to feel numb and insensible, which lasted for about twelve hours, but her mind was perfectly free from its influence. She experienced no headache or drowsiness.

July 20th. Pain in whole leg better since last injection, but has not entirely disappeared from the thigh, so I introduced one-fifth grain into the latter region.

28th. Leg altogether free from pain, but still complains of some in foot; otherwise she is improving. Injected one-fifth grain over instep.

Sept. 6th. Feels better. Slight pain around ankle joint. Injected one-tenth grain at this

point. This was the last injection she received, and she made an uninterrupted recovery.

CASE II.—B.; aged 50; carpenter; was first seen April 3d, 1886, when he complained of a severe pain for nearly two years in lumbar region, radiating down both legs. He is stiff in both legs and in the back, and rises from a chair with great difficulty. He had malaria, but gives no specific or rheumatic history. Injected half-grain doses of theine on each side of the sacrum, and two doses of similar strength near the trochanters on both sides. He said it relieved the pain and stiffness at once, and that he was as able as ever to get up from a chair.

April 6th. Says he is better, but still has some pain. Repeated the injections and internally gave him the quinine and ammonia mixture.

April 10th. Pain nearly all out of back, legs feel somewhat stiff. Two injections near the trochanters on both sides. Same internal treatment. This patient continued to improve, and was entirely well by end of same month.

CASE III.—S. M.; aged 49; came under my treatment March 25th, 1886, when she complained of pain in right hip, which extended down the limb of the same side. Impairment of motion and stiffness in same leg. Had malaria. At her first visit gave her quinine and ammonia mixture only. The next day, the 26th, she returned and reported that the pain was no better, and that it extended as far as the ankle joint. She said that she had a feeling as if a lump of ice were lying against her foot all the time. Injected half a grain of theine in right hip near the great trochanter.

April 1st. Some improvement—walks much better. Another injection of theine and same internal treatment.

April 3d. Pain all gone except below the knee; another injection.

April 4th. Coldness in foot has disappeared and is almost entirely free from pain. Another injection. She continued to improve.

CASE IV.—C. P.; aged 48; had pain in right hip joint on April 20th, 1886, which followed the course of the sciatic nerve on same side. Stoops with great difficulty. Had rheumatism. Injected half a grain of theine over painful spot in hip joint, which relieved him at once. Could stoop without pain after injection. Never saw him again.

CASE V.—L. M.; aged 60; came to me, April 22d, 1886, complaining of severe pain in sacral region, which radiated down both extremities as far as the knees. Injected half a grain on each side of sacrum, and she expressed herself much relieved immediately after the injection. Internally, she received the quinine and ammonia mixture.

April 24th. Better. Pain in sacral region almost gone, and she could walk better than before. Injected half a grain in the fleshy part of each leg.

April 27th. No pain in back. Did a heavy day's washing without producing any pain in



back since her last visit. This she had not been able to do for a long time. The only pain she complains of now is in her left leg from knee to ankle joint. Injected half a grain above the knee. The pain disappeared at once. With the same internal treatment, and an occasional injection, she continued to do well.

CASE VI.—E.; aged 35; came under observation June 20th, 1887, when he gave the following history: Pain along both sciatic nerves during the last three years. The attacks of pain come on simultaneously in both nerves, although the left leg is the worst. Some loss of motor power in this leg. Has had malaria and rheumatism, some burning in soles of feet. Injected half a grain of theine in each buttock over the course of the sciatic nerves. Internally, gave him the quinine and ammonia and soda salicylate mixtures, in alternation every three hours.

June 21st. Pain better last night than it has been for a long time. Slept well, which he had

not done for several nights. Gave him two more injections in same regions, and continued same internal treatment. The pain at no time became bad again, and in less than a month of the treatment outlined above he was entirely free from pain, could sleep well, had regained the want of power in his left leg, and he was able to resume his vocation.

The following three cases were reported to me by Dr. H. C. Fegley, of Ashland, Pennsylvania, who writes :—

“Since your article on the action of theine was published, I have had the opportunity of testing its analgesic effects in three very aggravated cases of sciatica. In two cases complete recovery, with the exception of slight stiffness of the leg in one, took place. The third was an aggravated case of three years’ standing, and, although not cured, was so much benefited that she is able to attend to her household duties.”

CASE VII.—S.; December 20th, 1885; had been unable to leave her chair, in which I found

her, for two weeks, the least movement causing the utmost agony in the whole left leg. When perfectly quiet, no pain was felt except occasional sharp twinges shooting down to the foot. I put her to bed and injected a quarter of a grain of Merck's theine into the thigh about the seat of greatest pain. The injection caused intense burning, which lasted about three minutes, when she said it had left her and that movement in her limb caused less pain. The following evening I injected half a grain; and repeated the dose a day after, when she felt, as she expressed it, entirely cured.

CASE VIII.—H.; January 10th, 1886; complained of intense, deep-seated pain in the leg, which had been coming on gradually for nearly a week. She never had sciatica before, and two injections, of three-quarters of a grain each, relieved her entirely.

CASE IX.—Mrs. A.; has been a sufferer for nearly three years, and has tried a great many remedies, with little or no benefit. Theine in

doses of a fifth of a grain relieved her only for three or four hours, but three-quarter grain doses gave her a full night's rest. The intense sciatic pain, she says, has passed away, but there are still some soreness and considerable stiffness in the limb.

Dr. S. reports his own case to me under date of December 21st, 1885, in the following language :—

CASE X.—“DEAR SIR: I have just this day read your article on the ‘Therapeutic Action of Theine,’ and would say that my own case is almost a *fac-simile* of your case Mrs. A. A. (which was a case of sciatica). I have tried every remedy I could think of, but have found nothing to give relief but injections of morphine. I had to give up the morphine on account of the constitutional effect which it brought on. My trouble was caused by being thrown from my cutter about a year ago, but had no severe pain until last August, when I became a subject of severe blood-poisoning, contracted

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during an operation, and from which time the pain in my limb began to be terrible. I went to the springs (Saratoga) and continued treatment for the poison. I feel so badly now that I find it impossible to write you in full. If you will be kind enough to send me some theine, with instructions how to use it, I will test it and have my case carefully reported to you. I would further state, that I returned from the springs about three weeks ago, but received no benefit. I am now, and have been, in bed for the past ten days, and I only hope that this new remedy will give me some relief from the most terrible pain possible to endure."

Under date of March 22d, 1886, Dr. S. states :  
"In relation to the theine, I will say that it has done its work for me. The first injection was made on December 25th, one-third of a grain in the morning, and one-third of a grain more in the evening. Then I followed this up with daily two-third grain doses for six days, then two doses of the same amount for the next three

days, then two doses in five days, and the last one in six days afterward. After this I was free from pain. My leg, which was three inches smaller than the opposite one, is now about its natural size. I am a thousand times your debtor for the theine you sent me, for I have full confidence that it gave me relief; and, so far as my sciatica is concerned, it made a cure without any bad effects.

Dr. Washington H. Baker, of Philadelphia, reports the following case:—

CASE XI.—L. N. W., aged 36; consulted me, Dec. 13th, 1885, on account of pain in his left hip, from which he had been suffering for eight months. Never had any disease of the genitalia. Has not had chills and fever, nor rheumatism. Had an attack of typhoid fever thirteen years ago, and been well ever since until the present trouble appeared. The greatest pain complained of is in the left hip, a little above the trochanter major; the pain also radiates around in front and down back of thigh.

The pain does not extend below the knee at present. Some time ago it extended to ankle joint. Tongue clean; bowels regular; appetite good. Is compelled to use a cane, and limps when walking.

Dec. 16th. Gave a subcutaneous injection of twenty minims of a two per cent. solution of theine. He felt better at once and could stand straighter. In a few minutes had a tingling sensation. Can walk more erect and with less pain. The thigh feels numb when touched, the leg less so. Half an hour after the injection the thigh still felt numb, but he could not walk quite so well. Was given five grains of iodide of potassium thrice daily. The injection was given about three inches above the seat of pain.

17th. Injected twenty minims of theine. Helped him some, but not a great deal. Applied a thapsia plaster to thigh.

18th. Less pain since yesterday. Injected twenty-five minims of same solution of theine.

19th. Walked down town to office this morning, a distance of twenty squares. Is feeling much better. Injected thirty minims of same solution.

21st. Feels better than he has yet. Injected twenty-five minims.

24th. Yesterday morning the pain returned in the limb. Last night it was just as bad as ever. Injected twenty minims, and after three minutes the pain began to grow less.

25th. Still considerable pain. Injected twenty-five minims.

26th. Had severe pain last night. Injected twenty-five minims.

28th. Still considerable pain. I gave him a pill of cinch. sulph., ext. nucis vomicæ, ext. belladonnæ and pil. ferri carb.

Jan. 6th. Better. Injected twenty-five minims of theine.

30th. Walked into office to-day, erect, very little pain, and only a slight limp. Considers himself cured.



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The following case was reported by Dr. C. H. Castle, of Cincinnati, Ohio :—

CASE XII.—Neuralgia of the sciatic nerve, chloroform, ether, etc., had failed as curative remedies, or even to relieve pain. Temporary relief was being sought in morphia.

4.05. Injected one-third grain of theine over the course of the sciatic nerve near its emergence from the pelvis.

4.10. Feels easier below seat of injection. Still tenderness on pressure over the nerve.

4.20. Still somewhat better.

4.25. Jerking sensation when walking, no pain when lying in bed.

4.35. Tingling sensation in heel ; walks much better.

5.00. Numbness from knee down to foot ; warm flashes.

5.30. Same feeling as at 5 P.M., with pain in hip.

6.00. Pain not so severe in hip ; numbness from knee down.

6.30. Complains of foot feeling very cold. It communicates this sensation to the hand.

7.00. No pain, but still a sensation of cold. Hot sand bags applied. Next morning pain had returned.

The two following cases were reported to me by Dr. George S. Gove, of Whitefield, N. H.:—

CASE XIII.—Injury to hip joint, of one and a half years' standing. The theine was used at first in small and afterward in large doses without any benefit, either alone or combined with morphine and atropine. Nor had morphine or atropine, combined or alone, any influence on the pain.

CASE XIV.—Patient aged forty-five; employed in a creamery; has had rheumatism; brought on a pain in his back by lifting a heavy milk can; worked all that day; had a restless night following; next day was quite lame and stiff; worked that day, but was used up by night time. During the night of the third day he had very little sleep on account of the severe

pain. Liniments and hot fomentations were applied without effect. When I saw him next morning the pain was so great that in trying to dress himself he fainted and fell to the floor. I gave him one-half grain of theine hypodermatically, about ten inches above the hip joint, and waited half an hour without affording much relief. I then gave him another half-grain injection, and the pain lessened. After a short time the pain entirely disappeared and has not returned since.

The following case was reported to me by Dr. J. L. Seibert, of Bellefonte, Pa. :—

CASE XV.—“On the 15th of September, 1886, I gave my patient, Mrs. L——, who was suffering intense sciatic pain, a superficial injection of twenty drops of theine solution, a little posterior to and above the trochanter major. She complained of considerable burning, which, however, lasted only a few moments, and in twenty minutes all pain had left her. At 12.30 A.M. (16th) the pain had re-

turned ; I was called, and gave her  $\frac{1}{12}$  grain of morphine and  $\frac{1}{80}$  grain atropine hypodermatically ; this gave her some ease, but she was not free from pain, and spent the remainder of the night without sleep. At 6 A.M. (same day, 16th) I again injected twenty drops of theine solution, which in twenty-five minutes was followed by complete relief from pain ; and again, at 9.30 A.M. (same day), when pain was returning, though not severe, I gave her ten drops more of theine solution, which relieved her entirely of all pain for remainder of day. At 8.15 P.M. I again visited her, and found her without pain, resting very comfortably, when she said that this was the first day she spent without pain for a week ; but fearing a return of the pain during the night, I gave her, at this visit, eight drops more of the theine solution. At my visit at 9 A.M., 17th inst., found her resting comfortably ; no pain ; had slept well all night ; this morning her nurse moved her to opposite side of bed without hurting her or giving any pain. Ex-

amination of limb showed some little tenderness on pressure over course of sciatic nerve—gave her five drops of theine solution. Saw her again at 7.15 P.M. (same day), when, for the first time in two weeks, her limb had been laid out straight alongside of its fellow—no pain now, but complains of some loss of sensation in both legs, though she can now move limbs herself. This good condition lasted for three days and nights, when the pain again set in, apparently more severe than any time before, and then theine in forty-drop doses subcutaneously gave her no relief, and I was obliged to resort to morphine, which quieted her again. This condition continued one week, when I stopped the use of morphine, and since which time all pain is again controlled by from ten to twenty drops of theine solution, which she gets from one to three times in two days. She is now convalescing.

“All injections were made in region of left hip (seat of trouble), and so thoroughly did

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theine deaden sensibility in this vicinity that the hypodermatic needle was introduced without the knowledge of the patient."

CASE XVI.—January 7th, 1886; case of double sciatica of fourteen years' duration in a gentleman sixty-five years old. Theine injections relieve the pain, but are powerless to cure the degeneration which had probably taken place in the nerves.

#### INTERCOSTAL NEURALGIA.

CASE XVII.—B. D.; aged sixteen; December 31st, 1885; complained of constant pain in right chest, which began about three or four months previously. She coughed and had a yellow expectoration; her appetite was variable, and she had nausea, and a disgust for fatty food; felt chilly and hot occasionally, but her heart and lungs were normal. It was found that she had tender spots along the spine, and pressure there increased the pain in the right side of the chest. She was placed on tonic treatment, and on the fifth of the following month she returned

and reported herself no better. Theine injection in the back relieved the pain at once. At this visit she also received the quinine and ammonia mixture. She failed to present herself again.

CASE XVIII.—H. H.; aged sixty-four; was first seen March 25th, 1886, when he had pain in chest; cough and copious expectoration; no hæmoptysis; malaria and rheumatism. Is addicted to the use of alcohol, and gives evidence of general bronchitis. Pressure along left side of the spine in interscapular region intensifies the pain in front of the chest. Injected half a grain of theine between shoulder blades, left side. April 1st: Better. Pain nearly all gone. Gave him another theine injection and prescribed a mixture for his cough.

CASE XIX.—H. C.; aged thirty; on April 22d, 1886, applied for relief of a severe pain at base of his right chest, which was aggravated by a deep inspiration. Had some cough and expectoration; was losing flesh; felt bad, but

never had malaria, rheumatism or syphilis. Lungs and heart normal. Tender spots along right side of spine. Injected one-half grain of theine over latter area. April 24th: Pain entirely gone. Also prescribed the quinine and ammonia mixture.

CASE XX.—May 1st, 1886, L. M.; aged fifty; complained of constant pain in the cardiac region, as well as of dyspnœa, and of some palpitation of the heart. Coughed, and had a yellow expectoration. Heart and lungs normal. Injected one-half grain of theine along left side of spine at junction of fifth rib. May 4th: Pain in region of heart much better. May 11th: Improved. Also gave him the quinine and ammonia mixture.

CASE XXI.—J. S.; aged twenty-four; was first seen April 14th, 1887, when he had an ill-defined pain in the left side of his chest—above and in the cardiac area; had some dyspnœa and palpitation of the heart and also had malaria and rheumatism. Heart and lungs



normal. Injected one-half grain of theine in left interscapular region. April 15th: Pain was entirely relieved; gave him another injection. April 20th: Still improving. Another injection over anterior seat of pain. Also prescribed quinine and ammonia, and with an occasional injection afterward, he became well.

CASE XXII.—Mr. B.; aged thirty; was entirely relieved of intercostal neuralgia, accompanied by a peculiar constant burning pain in the left interscapular space, by one injection, which was given over painful spot along left side of spine.

#### DORSAL OR INTERSCAPULAR NEURALGIA.

CASE XXIII.—M. C.; aged thirty. Pain only between shoulder blades, at which point there is a feeling as if she were in constant contact with "a lump of ice." Injected one-half grain of theine over affected spot, and gave her the quinine and ammonia mixture. She began to improve at once, and the cold feeling did not return as long as she was under observation.

CASE XXIV.—On the 27th day of April, 1886, E. complained of interscapular pain, which was relieved at once by the injection of one-half grain of theine.

CERVICO-BRACHIAL NEURALGIA.

CASE XXV.—H. K.; aged nineteen; was first seen February 9th, 1886, when she suffered with intermittent pain in right shoulder and in arm along the ulnar nerve. Injected one-half grain of theine at base of neck, and internally gave her the quinine and ammonia mixture. April 8th: No return of pain and feels good.

CASE XXVI.—Dec. 17th, 1885, Mrs. M.; aged fifty; suffering from cervico-brachial neuralgia on right side since the previous August. Two injections of half a grain each, a week apart, were sufficient to relieve the pain.

The following cases were reported by Dr. William Hall, of Conshohocken, Pa.:—

CASE XXVII.—I have used theine in three cases; two of cervico-brachial and one of in-

tercostal neuralgia. The case of intercostal and one of cervico-brachial neuralgia were entirely relieved. In the other case theine failed, as did all other remedies. This last case is a woman, whose father died of, and whose sister is suffering from, a similar form of pain. I am well pleased with the remedy in a fair case.

Dr. G. D. Bennett, of Newton, Kansas, reports the following case :—

CASE XXVIII.—In regard to my patient treated with theine, I would say that Mr. G. fell from his wagon in the early part of November, 1885, and dislocated his shoulder downward into the axilla, and also injured the brachial plexus of nerves, in the fall. The injury was followed by some pain, which grew to such severity that one-half grain doses of morphine gave him but partial relief. Some six weeks after receiving the injury, and when the pain in the shoulder was steadily growing worse, I commenced using theine hypodermatically, by injecting one-third of a grain in the morning. The result of

the first injection was some redness and pain at seat of injection, and in fifteen minutes numbness of finger ends appeared, which gave way, in half an hour, to a condition explained by patient as "arm being asleep." In a short time, probably forty minutes, pain in shoulder all gone. Next day visited patient, and found return of pain, but not so severe as before, and again injected one-third of a grain, which relieved him to such an extent that he had a comfortable day and an easy night. This treatment, for the next twenty days, was combined with tonics, at the end of which time my patient had complete use of his arm and no pain. I feel that we now have a remedy which is certainly far superior, at least was in this case, to morphine and cocaine, for they both had been tried thoroughly here.

#### OCCIPITAL NEURALGIA.

CASE XXIX.—O. C.; aged forty-five; complained of severe pain in the region of the oc-

ciput, on April 29th, 1886. The pain was paroxysmal, and appeared about every three weeks. Injected half a grain of theine on each side of head, which relieved her. May 8th. No return of pain.

## RHEUMATIC NEURALGIA.

CASE XXX.—Mrs. J. E.; aged fifty; consulted me, June 10th, 1886, concerning a pain and swelling in right knee. She had been subject to rheumatism, off and on, for the last twenty years, but eleven months ago she fell and hurt her knee, since which time she limps when she walks. Examination shows a tender spot in right hip joint. Injected half a grain of theine there, and, internally, gave her the soda salicylic mixture. Returned on the 12th, and stated that the pain in the hip had disappeared, but the knee still pained as before. Injected half a grain of theine above and below the knee, which relieved the pain in the latter place so much that she could walk without limping.

June 17th. Says she has less pain than she had for eleven months. Gave her two more injections, above and below knee, and same internal treatment.

August 30th. Feels good. There can be no doubt that, considering the age of this patient, as well as her predisposition to rheumatism, that the pain will return some time.

CASE XXXI.—April 22d, 1886, S. E.; aged fifty; an old rheumatic; complains of pain in left wrist, arm and ankle joint. Injected half a grain in arm and above ankle. Gave her, internally, the sodium salicylate mixture.

27th. Feels good. Pain in arm and joints gone. Continued same internal treatment.

CASE XXXII.—(Reported by Dr. Washington H. Baker.) March 8th, 1886, a gentleman, fifty-eight years old, told me that he had been suffering for several weeks with a pain in the left shoulder. He supposed it was rheumatism. He had been kept awake the greater part of the last three nights, on account of the pain.

The pain was getting worse from day to day. I injected twenty-five minims of a two per cent. solution into the shoulder, with immediate relief. That night he slept comfortably, and has not had any pain in shoulder up to date (March 20th, 1886). After the injection, a burning, tingling sensation was complained of at site of injection. The theine had no appreciable effect on the mental faculties.

CASE XXXIII.—Dec. 5th, 1885, V.; chronic rheumatic pain of left shoulder joint and whole arm. Pain very severe. No relief rendered previously by salicylates, ammonium chloride, iron, quinine, or potassium iodide. Half a grain of theine above shoulder joint made him comfortable at once.

#### SPINAL IRRITATION.

CASE XXXIII.—February 3d, 1886, W.; aged thirty. This was a most aggravated case of neuralgia of both lumbo-sacral and left cervico-brachial plexuses, associated with irritability of the spine along its whole course. The pain had

been coming on for two months or more. It was intermittent, very intense, and accompanied by muscular contractions of both legs below the knee, and left forearm. It was impossible for the patient to stand erect when he suffered from the pain—in fact, he was confined to his bed most of the time. Four injections, of one-sixth grain each, in the evening, made him comfortable during the night and next day until evening, while with other remedies, like potassium iodide, iron, ammonium chloride, quinine, phosphoric acid, strychnine and cod-liver oil, have been kept up for nearly three weeks, and now (March 1st) the patient is in a good condition, able to walk twenty-five squares in one stretch, and only requires an occasional injection. The injections were all made on each side of the spine, in the interscapular and lumbo-sacral region, and never failed to give him instantaneous relief, no matter how severe the pain was at the time.



## NEURASTHENIA.

CASE XXXIV.—(Reported by Dr. H. Woddrop, Loag, Pennsylvania.) M. ; married ; aged forty ; was found, last December 4th, with considerable pain, of intermittent character, in left leg. For a month previous he had been suffering with occasional twitches of pain, and was now confined to his couch. He also had stiffness as well as œdema in his other limb. He was treated with morphine (by the mouth and subcutaneously), ammonium chloride, quinine, iron, strychnine, and arsenic, until the last of December, when the swelling had entirely disappeared, but there were considerable pain and stiffness left in the limbs. About this time I saw your article on theine, procured some, and injected one-fifth of a grain deep into the calf of the left leg. This caused some pain, and succeeding symptoms were very near your description. Continued internal treatment and subcutaneous injection of theine occasionally. On January 19th changed internal treatment

to small doses of phosphorus, beef peptonoids and milk. On January 23d could move his limbs freely, had no pain, and appeared, excepting debility, a well man. He received, in all, twenty-four injections, sometimes twice a day. I attribute his recovery, in great part, to theine, but the constitutional treatment was also very important. I have no doubt that, by the use of theine, I shortened the case materially. The burning which was occasioned by the injections lasted about fifteen minutes, after which the pain in the limbs ceased. The pain returned at varying periods, not as severe after the injections as before, and it always subsided directly after the use of theine. I believe theine to be a perfect analgesic, and have noticed no narcotic effects from its employment.

THEINE IN THE TREATMENT OF OTHER PAINFUL DISEASES.

I think sufficient evidence has now been adduced to show the usefulness of theine in pure and uncomplicated nerve pain, or in diseases in

which the pain is strictly limited to the sensory nerves. In the succeeding pages, proof will be offered to show that it is also a true analgesic in those kinds of pain which are not supposed to be absolutely confined to nerve tissue, viz.: muscle pain. On the whole, it may be said, however, that the distinction between nerve and muscle pain is more artificial than genuine. Although the organs of sensation and of motion are intimately associated, and are both evolved out of the same fundamental tissue, practically, there can be no sensation or pain independent of nerve tissue. Hence, while it is true that in myalgia there is a diffusion of pain rather than localized spots of pain along the trunk of a nerve, as in neuralgia; that the pain of myalgia is more aggravated by movement than that of neuralgia; and while it is true that there are other clinical differences between the two affections, there is reason for believing that the pain of myalgia is as truly nervous as that of neuralgia.

Below will be presented the histories of some cases of myalgia and of lumbago, as well as of other non-neuralgic diseases, in which theine yielded as good service as it did in those of neuralgia.

MYALGIA.

CASE XXXV.—(Reported by Dr. Castle, of Cincinnati, Ohio) Myalgia of the deltoid muscle. Pain severe. Had had one-quarter grain of morphine every two hours the night before, without bringing sleep. Could not raise arm.

9 P. M. One-sixth grain of theine subcutaneously about the anterior margin of the trapezius, just above the shoulder; pulse, 102.

9.04. Very little pain, unless she moved her arm. Still marked tenderness on pressure.

9.05. Pulse 96. Diminished sensibility about seat of injection.

9.10. Seat of pain seemed to be only in lower half of its former area.

9.13. Numb feeling in arm as far down as elbow. Very little pain on moving arm.

9.15. Can now bear pressure over former exquisitely tender spot.

9.20. Pulse 96. Only tenderness is now over acromion. No pain at all on pressure over anterior part of arm.

9.30. Numbness not so marked. Says, if only had as much pain as she now has, she could easily bear it.

9.37. Pain now only about insertion.

9.40. Numbness in arm diminishing, but pain not increasing. Says she could go to sleep.

11.00. Pain has returned, but in a much less degree. Needs no morphine.

Since then has not complained.

CASE XXXVI.—April 7th, 1886. M. G., aged 32, suffered from severe pain in and below left shoulder joint. Injected half a grain of theine, which relieved him before he left the office. Never saw him again.

## LUMBAGO.

CASE XXXVII.—March 25th, 1886. D. O.; aged 44; laborer; complained of severe pain in back, which was almost exclusively confined to the lumbar region. Cannot bend body, or sit down without a great deal of pain. Walks very stiffly. These attacks occur periodically. Injected one-third of a grain of theine on each side of the sacrum, and in a few minutes he was able to stoop, and sit down without any inconvenience. He expressed himself as being well pleased.

CASE XXXVIII.—April 29th, 1886. G. T.; aged 33; laborer; suffers from pain and weakness in the lumbar muscles. Injected half a grain of theine on each side of painful region.

May 8th. Less pain since injection. Injected another half-grain.

Oct. 9th. No pain in back since last injection.

CASE XXXIX.—March 30th, 1886. S. M.; aged 45. Has had fever and ague and complains of

pain in the lumbar region. She says, "The pain catches me in the back when I rise." Gave her quinine and iron.

April 1st. Pain in back very severe. She now received half a grain of theine over painful spot, and she felt better at once. Same internal treatment.

April 17th. No return of pain.

CASE XL.—(The two following cases were reported to me by Dr. Baker.) J. B. came to me in December, 1885, complaining of a severe pain in the lumbar region, which almost incapacitated him for work. Injected twenty-five minims of a two per cent. solution of theine in lumbar region above painful part. He was relieved at once, and has not been troubled with it since.

CASE XLI.—J. R. W.; aged thirty years; brakeman; suffered from pain in the lumbar region, which troubled him, particularly when he bent over to wash his hands. I injected twelve minims of a two per cent. solution of theine

under the skin above the painful spot, with immediate and entire relief of pain. It was really ludicrous to see the astonished expression on his countenance, and the contortions he went through to assure himself that he was, in truth, relieved. I also gave him two and a half grains of potassium iodide thrice daily.

Dec. 22d. Injected twenty-five minims of theine, as there was a suspicion of pain in the back. This visit was one week after the first.

Jan. 12th, 1886. Reports no trouble with his back.

#### MUSCULO-RHEUMATIC PAIN.

CASE XLII.—(Reported by Dr. Castle.) The patient was the subject of those ill defined, dragging, musculo-rheumatic pains of the extremities, found not infrequently in such a damp climate as is ours. About one year ago he had obtained marked relief from an electric bath, taken in Chicago, and at the time I encountered him he was on a search for a similar electropathic institution in Cincinnati.



I persuaded him to allow me to use one-sixth of a grain of theine upon him hypodermically. The pain was severe in the anterior muscular masses of both thighs and in the calves of both legs. I made my injection slightly below the popliteal space, and toward the inner side of the leg. The effect was striking and almost instantaneous. The point of injection, though angry-looking, was quite anæsthetic, and as little tinglings shot down the leg toward the foot, the pain vanished and the analgesia of the injected leg was in marked contrast to the pain in the thigh of the same extremity and the thigh and leg of the opposite extremity. This beneficial effect was maintained for a few days, at which time I last saw the patient, and I exceedingly regret that we have neither of us had the time or opportunity to relieve the still suffering fragments of his body of their aches.

## PAIN OF LOCOMOTOR ATAXIA.

CASE XLIII.—April 4th, 1886. J. P.; aged 50. Suffering for three years from locomotor ataxia.

Has been unable to walk or move his arms for three months, and on account of the pain in the back, arms and legs he is compelled to pass days and nights without sleep. Has well-marked constriction around the base of his chest and suffers from œdema and spasmodic contractions of both extremities. This patient received two and a half grains of theine every other day, in different spots along the spine, with the effect of giving him relief to his pain. This course was pursued for about four months, and while it did not ameliorate his general condition, it gave him sleep, relieved the pain and contractions in the back and extremities, removed the thoracic constriction, and, on the whole, it made the patient feel more comfortable than he was before.

It is but fair to state here that, in another case of locomotor ataxia, the theine injections signally failed to relieve the pain. This patient was, however, addicted to the protracted use of large doses of morphine, and the pain of which

he complained was chiefly referred to the stomach, and, no doubt, partook of the nature of opium pain. This was promptly relieved by the subcutaneous administration of morphine.



## APPENDIX.

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DR. CHARLES K. MILLS, President of the Philadelphia Neurological Society, made the following remarks on a paper entitled "Theine in Pain," which I had the pleasure of reading before that Society, December 19th, 1887 [copied from *Journal of Nervous Diseases*, January, 1888]:—

"A few months ago I began the use of theine, ordering it in nearly every case of neuralgia, superficial neuritis or lumbago that came to the Polyclinic service, and also using it at the Philadelphia Hospital. I have used the drug probably in about fifteen cases, but I have not had time to prepare notes of them for this meeting. I recall three cases of sciatica, two of which were of long standing. These cases were all improved, but none of them were cured, by the use of theine alone. The pain was usually much relieved by the hypodermatic use of theine, but it would return after a shorter or a longer time. In connection with the theine, I used galvanism to the nerve and muscles, and internally Donovan's solution, or iodide of potassium. Two of the cases of sciatica were cured under this conjoint treatment.

"In a case of facial neuralgia, or neuritis, I used a hypodermic of theine in the face; following this, the patient became pale, sick at the stomach, and seemed to be in a slightly dazed condition for a time. Whether, this was due to the drug or simply to the slight operation, I cannot say. The injection entirely relieved the pain for three days. The patient then returned, and another injection was given, without bad effect. In another facial case the patient was certainly relieved by theine, and, so far as I know, remained well.

"I have used it in the back with great benefit in so-called myalgia, including under that term muscular rheumatism, and possibly true lumbar neuralgia.

"I believe that theine is an analgesic; that it relieves pain in cases of recent and superficial neuritis, or neuralgia. In chronic, painful nerve troubles, particularly where the nerves are deeply situated, it seems to be simply a helping remedy, and sometimes fails."

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